

periods, that of the sulfa drugs, and that of the sulfa drugs with penicillin. We have no series available with the use of streptomycin. In this series sulfathiazole crystals were used intraperitoneally and in the wound, in 59 cases. In 1941 the sulfa drugs were commenced both locally and generally, and in 1945 penicillin was added as well. Since the combined therapy there has been great improvement in the mortality.

The mortality, in the period 1936 to 1941 before sulfa drugs or continuous suction, in 30 cases, was 5 deaths, or 17%. In the period from 1941 to 1943 in which sulfa alone was used, there were 25 cases, with one death, or 4%. From 1943 to 1945 sulfa drugs and continuous suction were used in 29 cases, with 4 deaths, or 13.8%. From 1945 to 1947 sulfa drugs and penicillin and continuous suction were used in 37 cases, with 3 deaths, or 8.1%. Of this latter group two patients, clinically and at post-mortem, were getting over the peritonitis very well, and died of bilateral pneumonia. The general mortality for 91 cases was 8 deaths, or 8.8%. In 1947 there have been no deaths to date.

It has been reported that the mortality of acute appendicitis in a large American city, was 3.54%. In another series, it is stated that in acute appendicitis, one in 183 die; in acute appendicitis with local peritonitis, one in 44 die; and in acute appendicitis with spreading peritonitis, one in 4 die. In 1941 the mortality in the U.S.A. (for perforated appendicitis) was 18%. In our series, from July 1936, to July 1941, there were 336 cases, with 8 deaths; a mortality of 2.4%. From July 1941, to July 1947, there were 330 cases, with eight deaths; a mortality of 2.4%. Excluding the perforated cases, it was found that in 246 cases, there was one death; a mortality of 0.4%. This death was described as due to pulmonary embolus.

There has been a marked improvement in morbidity in the last seven years. The average hospital days, for those cases having sulfa drugs, was 24.4 days; and those having sulfa and penicillin, was 18.7 days. It is to be noted that the more severe cases all had chemotherapy.

CONCLUSIONS

A study of acute perforated appendicitis, in the past eleven years shows that since the introduction of the Wangenstein continuous suction and chemotherapy, the mortality has been halved. Complications have been reduced, and the number of days in hospital have also been greatly reduced. It is imperative that every case of appendicitis be recognized and treated at the earliest possible time.

Medical Arts Bldg.

EXPERIMENTAL USE OF A SKIN-LINED TUBE IN THE GREATER OMENTUM*

(A Preliminary Report)

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In 1946 MacLean and Gerrie¹ reported successful reconstruction of the male urethra by means of a free skin graft in tubular form. Peer and Paddock,² and others, observed the fate

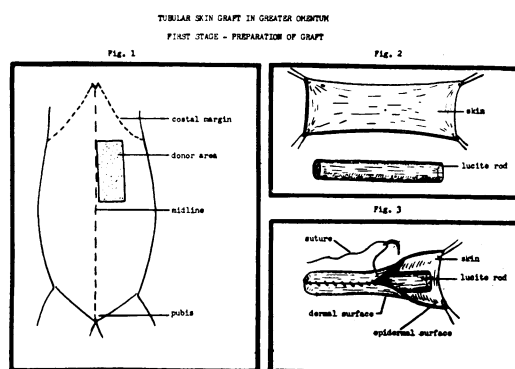


Fig. 1.—First stage operation. Three sketches showing preparation of graft.

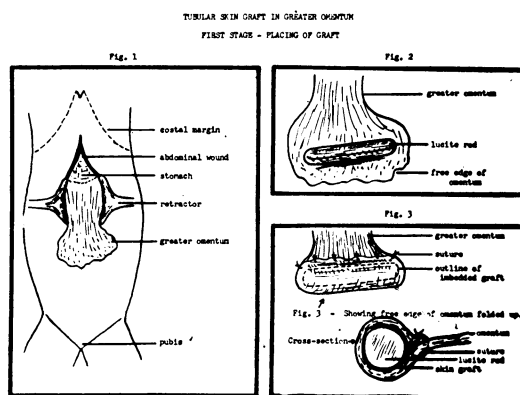


Fig. 2.—First stage operation. Three sketches showing transplantation of prepared graft to greater omentum.

of skin buried beneath the surface of the body. Several surgeons, including Mair,³ have used skin grafts in the repair of abdominal hernias. These reports show that buried skin survives, and that it resists intermittent exposure to urine. It therefore occurred to one of us (J.R.M.) that skin might also be used for the replacement of otherwise irreparable defects in certain tubular viscera; notably the bile duct,

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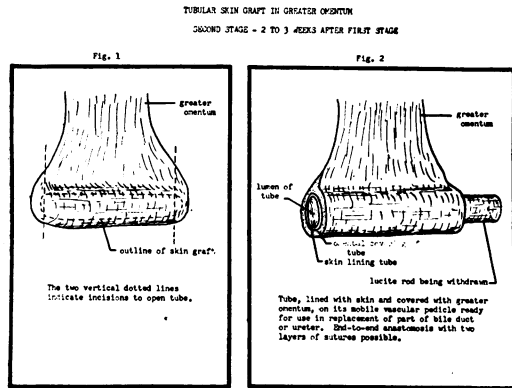


Fig. 3.—Second stage operation. Two sketches showing preparation of skin-lined tube.

ureter and esophagus. Accordingly, we decided to implant a skin-lined tube in the free edge of the greater omentum. This site was chosen as a bed for the graft because of its two important characteristics: rich vascularity, and great mobility. It was felt that, once the graft had "taken", it should be possible to swing it into any position in which it might be required to serve as a connecting tube.

METHOD

Free split-thickness and free full-thickness skin grafts were embedded, in tubular form, in the free edge of the greater omentum of rabbits and dogs (Figs. 1 and 2). The condition of the grafts was studied grossly and microscopically

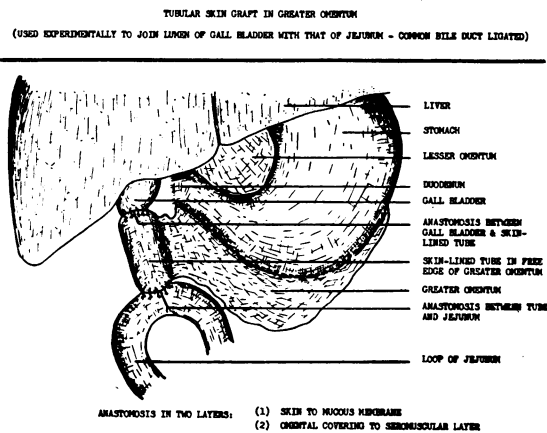


Fig. 4.—Second stage completed. Sketch shows tube connecting gall bladder and jejunum, after ligation of common bile duct distal to cystic duct.

at intervals of 11 to 48 days after implantation. In one rabbit and one dog a pre-formed, skin-lined tube of the above type was used to drain bile from the gall bladder into a proximal loop of jejunum, following ligation of the common bile duct distal to the cystic duct (Figs. 3 and 4).

RESULTS

Free split-thickness and free full-thickness tubular skin grafts survived and acquired a rich vascular supply in the omentum of four rabbits and three dogs. There was no gross evidence of infection caused by the grafts, and only minimal inflammatory cell infiltration and fibrosis were evident in our sections (Figs. 5 and 6).

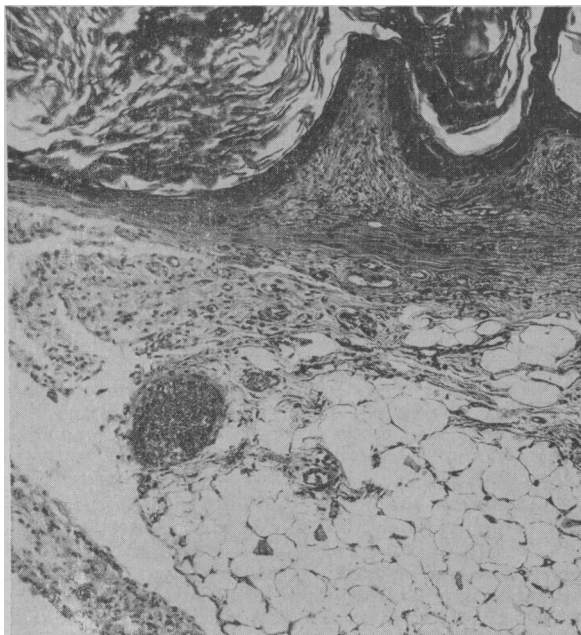


Fig. 5

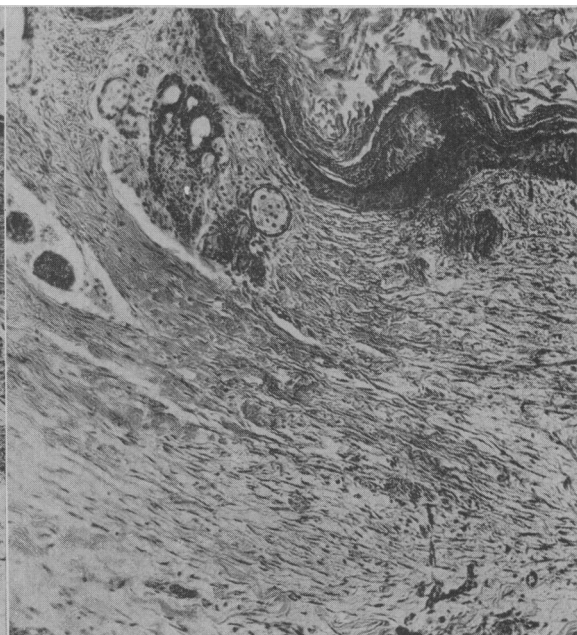


Fig. 6

Fig. 5.—Part of a cross-section of a tubular split-thickness skin graft in the omentum of a rabbit, 34 days after transplantation. Note vascularity of dermis, absence of inflammatory reaction and survival of epidermis. Fig. 6.—Part of a cross-section of a tubular full-thickness skin graft in the omentum of a rabbit, 17 days after transplantation. Note vascularity of dermis and presence of sebaceous glands and hair follicles. Accumulated desquamated material was not removed before sectioning.

The second stage operation, in which bile was drained from the gall bladder into the jejunum, was performed on a rabbit 17 days after implantation of a graft. This animal died on the second postoperative day from bilateral pneumonia. However, autopsy showed that the tube had functioned well and that no leakage had occurred at the suture lines.

The second stage operation was also performed on a dog in the omentum of which a full-thickness tube had been implanted 20 days previously. This animal remained in good health, without evidence of biliary obstruction, until 24 days after operation. It then began to lose weight and, when sacrificed on the twenty-eighth postoperative day, presented definite jaundice. At autopsy, the lumen of the skin tube was found to be about one-half its original diameter (4 mm.). Narrowing was most marked at the mid-portion of the tube. Both sites of anastomosis were patent and complete obstruction of the common duct distal to the cystic duct was confirmed. There was no evidence of bile leakage, but several small biliary concretions were adherent to the muco-cutaneous silk sutures at the jejunal end of the tube.

DISCUSSION

To date, this investigation has shown that, in rabbits and dogs, free tubular skin grafts survive when embedded in the greater omentum; that they heal along their suture lines, retain their structural characteristics and resist prolonged exposure to bile. Infection caused by the skin has not as yet been observed. The omental covering of these tubes provides the advantage of a second, sero-seromuscular, layer of sutures in addition to the muco-cutaneous layer.

It appears that split-thickness are preferable to full-thickness grafts and these should be cut thin in order to exclude the greatest possible amount of elastic tissue and accessory skin structures.

Among the disadvantages of the use of skin within the abdomen is the necessity of a two-stage operation. In certain cases, previous intraperitoneal disease may have seriously reduced the mobility of the greater omentum. Possible complications include infection, fistula formation, compression, stenosis or necrosis of the tube, and the formation of concretions within its lumen.

CONCLUSIONS

Free tubular skin grafts survive when embedded in the greater omentum of dogs and rabbits. At this early stage of our investigation it is possible to say that, in a dog, such a tube (full-thickness) conducted bile satisfactorily for 24 days.

REFERENCES

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ECONOMIC ASPECTS OF TOBACCO ADDICTION.—At a meeting of the Society for the Study of Addiction on January 20 Mr. Zachary Cope, F.R.C.S., said that tobacco had already achieved an economic status in 1492, when Columbus discovered it in use among the American Indians. The earliest reference to it mentioned the leaves as being bartered for other commodities. By 1523 a tobacco trade had been established in Portugal. Even the calumet, or pipe of peace, was of economic and political importance. The area in which the red stone was mined for making these pipes became sacred, to enable the manufacture of pipes to continue during war, and afforded sanctuary to refugees. Smoking had become so well established in England by 1560 (nearly all the tobacco coming from the West Indies through Spain) that Queen Elizabeth was able to put a duty of 2d. on each lb. Virginia was first successfully colonized in 1607. No money was allowed to be exported from England thither; so the colonists adopted the Indian practice of using tobacco as currency. At first they acquired the tobacco from the Indians, but John Rolfe, who married Pocahontas, started to grow his own tobacco; and soon all the colonists were doing so (manufacturing their own money) to such an extent that a law was passed that no-one should plant tobacco before he had planted 2 acres of corn. By 1639 Virginia produced 1,500,000 lb. of tobacco annually.

This industry had inevitable repercussions on the labour market. When the tobacco farms grew too large for the colonists to manage, they imported indentured apprentices from England; but this made them have to change each employee every five years, which was inconvenient. So black slaves were imported from West Africa, and the tobacco and slave trades rose and flourished together. About 1800 the cotton trade joined these two and detracted somewhat from the tobacco trade. But in 1849 was discovered the light yellow leaf which became so popular that tobacco production was doubled in ten years, becoming indeed of really tremendous economic importance. Next the American civil war crippled the industry by destroying the tobacco farms and liberating the slaves; and recovery was slow. Finally came the war of 1939-45, during which the yearly output of tobacco rose from 1,400,000,000 lb. to 2,300,000,000 lb.

So much for Virginia. What about England? It is said that as early as 1614 there were 7,000 shops in London at which tobacco could be bought. King James, author of the famous *Counterblast to Tobacco*, put on an additional tax of 6s. 8d. a lb. This led the English to emulate John Rolfe and grow their own tobacco, especially in Gloucestershire. Naturally this interfered with the Virginian trade, and the planters protested that their livelihood was being taken from them. So tobacco-growing was banned in England. Troops were used to ferret out the plantations, and a special officer was appointed to suppress them. But it took seventy years to stamp out the practice. The trade with Virginia was used as a cradle for the Royal Navy. By the Navigation Act of 1651 all goods from the colony had to be shipped in either English or colonial ships. A few years later there were 100 vessels engaged in this trade; and on one occasion 300 vessels sailed with the year's crop of tobacco.

At present the annual consumption of tobacco is 5 lb. per caput in the United Kingdom, and 7 lb. in the U.S.A. The tax of 54s. 10d. a lb. in the U.K. now represents an annual tax of £10 per caput of the entire population, or £20 per caput of all adults. The world's production of tobacco is now 7,000,000,000 lb., or 2 lb. per caput of its population. And the wheel has come full circle as regards the use of tobacco as currency, for everyone knows that 200 cigarettes were equivalent to £30-50 in occupied Germany after the war. The difference between the cost price (1s. 2d. a lb.) of tobacco in the U.S.A. and the selling price (£3 a lb.) in the U.K. is an enormous incentive to smuggling.—*The Lancet*, January 31, 1948.